

REMARKS

First, the applicants note with appreciation the indication in the Official Action that Claims 10 and 11 would be allowable if rewritten in independent form. Claim 10 has been rewritten in independent form. Accordingly, it is respectfully submitted that Claim 10 and Claim 11, which depends from Claim 10, are now allowable.

Claims 1-6, 12 and 15-18 under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 6,528,433 (hereinafter “Gartner”) in view of the reference “Silicon Processing for the VLSI Era”, Volumes 1 - 3 (hereinafter “Wolf”). This rejection, which appears on pages 3-9 of the Official Action, is respectfully traversed for the following reasons.

Claim 1 recites “[a] method of determining the nitrogen content of a nitrided gate oxide layer on a semiconductor substrate comprising:

oxidizing the nitrided gate oxide layer on the substrate;

measuring the thickness of the oxidized nitrided gate oxide layer;

optionally calculating the change in thickness of the oxidized nitrided gate oxide layer;

and

determining if the measured thickness or calculated change in thickness of the oxidized nitrided gate oxide layer exceeds a predetermined value.”

According to the Official Action, Gartner teaches: oxidizing an oxynitride layer on a substrate (column 3 lines 22-50); measuring the thickness of the oxidized oxynitride layer (4) by calculating the change in thickness of the oxidized oxynitride layer by ellipsometry (column 3 lines 32-60); and determining if the calculated change in thickness (around 25 nm) of the oxidized oxynitride layer (4) exceeds a predetermined value of 30 nm (the thickness of the oxide layer had the substrate not contained nitrogen) (column 3, lines 32-60). As acknowledged in the Official Action, however, Gartner fails to explicitly teach that the oxidized layer is a nitrided gate

oxide layer. In order to arrive at the claimed invention, the Examiner relies upon the disclosure on page 649 (vol. 3) of Wolf of a nitrided gate oxide layer that is reoxidized (pg. 3 of the Official Action).

Wolf, however, discloses that “ . . . the thickness of the nitrided films remains basically unchanged during the reoxidation step” and that only if “excessive reoxidation” takes place can thermal oxidation resume (pg. 649, 2nd full paragraph of Wolf). Therefore, in our opinion, one of ordinary skill in the art would not have been motivated to combine the references in the manner set forth in the Official Action to arrive at the invention as defined by Claim 1. In particular, Wolf, which discloses that the thickness of the nitrided film remains basically unchanged during reoxidation, teaches away from combination with Gartner which, as set forth in the Official Action, discloses measuring the *change in thickness* of the oxide layer. It is well established that a reference must be considered in its entirety, including portions that lead away from the claimed invention. Additionally, there would have been no reasonable expectation of success in view of the above cited disclosure in Wolf to combine the reference teachings in the manner set forth in the Official Action. Therefore, the Official Action has failed to establish a *prima facie* case of obviousness. Accordingly, it is respectfully submitted that Claim 1, as well as dependent Claims 2-6, 12 and 15-18, are patentable over Gartner in view of Wolf. Reconsideration and withdrawal of the rejection of these claims is therefore respectfully requested.

The Examiner has also rejected Claims 7-9 under 35 U.S.C. §103(a) as allegedly being unpatentable over Gartner in view of U.S. Patent No. 5,904,523 to Feldman et al. (hereinafter “Feldman”). This rejection, which appears on pages 9 and 10 of the Official Action, is respectfully traversed for the following reasons.

First, Claims 7-9 depend from Claim 1. Further, in the rejection of these Claims, the Examiner has incorporated all of the arguments made with respect to the rejection of Claim 1

(See page 9 of the Official Action). Accordingly, the rejection of these claims should have properly been a rejection over Gartner taken with Wolf and further in view of Feldman. In view of the above, clarification of the rejection is respectfully requested.

In any event, since this rejection relies upon the arguments made with respect to the rejection of Claim 1, Claims 7-9 would be patentable over the cited references for at least the reasons set forth above with respect to Claim 1. Reconsideration and withdrawal of the rejection of these claims is therefore respectfully requested.

The Examiner has also rejected Claim 13 under 35 U.S.C. §103(a) as allegedly being unpatentable over Gartner taken with Wolf and further in view of “Semiconductor Manufacturing Technology” by Quirk et al. (hereinafter “Quirk”). This rejection, which appears on pages 10 and 11 of the Official Action, is respectfully traversed for the following reasons.

First, Claim 13 depends from Claim 1. Further, in the rejection of Claim 13, the Examiner has incorporated all of the arguments made with respect to the rejection of Claim 1 (see page 10 of the Official Action). Accordingly, Claim 13 would be patentable over the cited references for at least the reasons set forth above with respect to Claim 1. Reconsideration and withdrawal of the rejection of Claim 13 is therefore respectfully requested.

Claim 19 has also been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 5,862,054 to Li (hereinafter “Li”) in view of Gartner and Wolf. This rejection, which appears on pages 11 and 12 of the Official Action, is respectfully traversed for the following reasons.

In the rejection of Claim 19, the Examiner relies upon the alleged teaching in Gartner and Wolf of “ . . . measuring the thickness of an oxidized nitrided gate oxide layer . . . to correlate the reoxidized layers thickness with the nitrogen content of the nitrided gate oxide” (pg. 12 of the Official Action). However, as set forth above with respect to Claim 1, one of ordinary skill in the

art would not have been motivated to combine the teaching in Wolf of a nitrided gate oxide layer that is reoxidized with the teachings of Gartner as set forth in the Official Action. Accordingly, Claim 19 would be patentable over the cited references for at least the reasons set forth above with respect to Claim 1. Reconsideration and withdrawal of the rejection of Claim 19 is therefore respectfully requested.

CONCLUSION

All rejections having been addressed by the present amendments and response, Applicants believe that the present case is in condition for allowance and respectfully request early notice to that effect. However, if any issues remain to be addressed in this matter which might be resolved by discussion, the Examiner is respectfully requested to call Applicants' undersigned counsel at the number indicated below.

Respectfully submitted,

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